

1

TECHNIQUES FOR MOBILE DEVICE CHARGING USING ROBOTIC DEVICES

CROSS-REFERENCE TO RELATED APPLICATIONS

The present disclosure is related to and incorporates by reference for all purposes the full disclosure of U.S. patent application Ser. No. 14/673,744, filed Mar. 30, 2015, issued as U.S. Pat. No. 9,492,922 on Nov. 15, 2016 and entitled “TECHNIQUES FOR MOBILE DEVICE CHARGING USING ROBOTIC DEVICES”.

BACKGROUND

The general public uses electronic mobile devices such as cell phones, tablets, laptops, or the like to perform a myriad of daily tasks. It can be quite inconvenient to a user when one of these devices runs out of battery power. This is especially true if the user does not have an available charging adapter for the device. Users may find themselves asking friends, or even strangers, to borrow a charging adapter. In some cases, there may not be any charging ports, or power outlets in the immediate vicinity, making charging the device even more cumbersome. Even in cases where charging stations, ports, or outlets are available, a user may have to remain close to the device. For example, charging a phone in a public place may require the user to remain in the general area of the phone to avoid theft. For the aforementioned reasons, conventional techniques can make it difficult to charge electronic devices in a public or semi-public space.

BRIEF DESCRIPTION OF THE DRAWINGS

Various embodiments in accordance with the present disclosure will be described with reference to the drawings, in which:

FIG. 1 is a pictorial diagram illustrating an example environment suitable for implementing aspects of a charging management system that utilizes a robotic device to provide charging capabilities to a mobile device, in accordance with at least one embodiment;

FIG. 2 is a block diagram illustrating an example architecture for a charging management system, in accordance with at least one embodiment;

FIG. 3 is a block diagram illustrating an example architecture of the robotic device shown in FIG. 1 that is configured to be utilized by the charging management system, in accordance with at least one embodiment;

FIG. 4 is a block diagram illustrating an example computer architecture for a charging management engine that may be implemented by the charging management system to carry out various embodiments;

FIG. 5 is a pictorial diagram of an example robotic device to be utilized by the charging management system, in accordance with at least one embodiment;

FIG. 6 is a pictorial diagram of another example robotic device, in accordance with at least one embodiment;

FIG. 7 is a pictorial diagram of yet another example robotic device, in accordance with at least one embodiment;

FIG. 8 is a schematic diagram illustrating an example method 800 for providing electronic mobile device charging by a charging management system using a robotic device managed by the charging management system, in accordance with at least one embodiment;

FIG. 9 is a flowchart illustrating another example method by which the charging management system interacts with a

2

robotic device to providing charging to an electronic mobile device, in accordance with at least one embodiment;

FIG. 10 is a schematic diagram illustrating yet another example method for providing electronic mobile device charging by a charging management system using a robotic device, in accordance with at least one embodiment;

FIG. 11 is a block diagram illustrating still one further example method for providing electronic mobile device charging by a charging management system using a robotic device, in accordance with at least one embodiment;

FIG. 12 is a block diagram illustrating an example method for leasing an electronic device by a user using a charging management system and a robotic device, in accordance with at least one embodiment; and

FIG. 13 is a block diagram illustrating an example method for performing an action with respect to an electronic device, in accordance with at least one embodiment.

DETAILED DESCRIPTION

In the following description, various embodiments of the present disclosure will be described. For purposes of explanation, specific configurations and details are set forth in order to provide a thorough understanding of the embodiments. However, it will also be apparent to one skilled in the art that the embodiments may be practiced without the specific details. Furthermore, well-known features may be omitted or simplified in order not to obscure the embodiment being described.

Techniques described herein are directed to a charging management system that interacts with a robotic device to provide charging capabilities to a mobile device. In at least one example, a user may enter a public or semi-public space (e.g., an airport, a shopping center, a health-care center, a hotel, a place of business, or an educational institution). While at, for instance, an airport, the user's mobile phone may drop under a threshold of remaining battery power (e.g., 10%). The user may not have a charging cable with him or her, and/or there may not be an electrical outlet nearby. Using a charging application on his or her mobile electronic device, e.g., a smartphone, the user may request that a robotic device (hereinafter referred to as a “robot”) come charge his or her phone. In the following disclosure, a “robot” is meant to include an autonomous, or semi-autonomous, electro-mechanical device that is guided by a computer program and/or electronic circuitry. The request may include at least one of a location of the mobile electronic device, a type of the mobile electronic device, a charge level of the mobile electronic device, or a request time. The request may be received wirelessly by a charging management system that manages mobile device charging via robots.

In response to the request, the charging management system may select a robot from a number of robots and communicate instructions to the robot to cause the robot to travel to the location of the user. Upon arriving at the user's location, the robot may be instructed by the charging management system to present the user with a number of user activities via a user interface (e.g., a touchscreen display, physical buttons located on the robot). “User activities,” as used herein, is meant to refer to actions conducted by the user via the robot including, but is not limited to, viewing an advertisement, participating in a survey, participating in a crowd-sourcing activity that uses human intelligence to perform a task that a computer is incapable of performing, browsing for an item and/or conducting a purchase of the item from an electronic marketplace, using the robot to